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PATENT

Attorney Reference Number 6047-67518-01
Application Number 10/731,995

Remarks

Reconsideration is requested in view of the preceding amendments and the following remarks. Claims 40 and 41 are pending, and new claims 42-55 are submitted for consideration. Upon entry of this Amendment, claims 40-55 are in the application.

Claim 40 is amended to recite that a second mold portion defines a rib having a thickness at least as great as a solder bump thickness. Support for this amendment can be found in the specification at, for example, page 4, lines 9-10 and page 7, lines 18-22. Support for new claims 42-55 can be found in the specification at, for example, 6, line 25 to page 7, line 2, page 7, lines 18-22, page 8, lines 18-22, and page 10, lines 15-16. No new matter is introduced.

Claims 40-41 stand rejected as allegedly anticipated by Tsunoda et al., U.S. Patent 5,914,531 ("Tsunoda"). This rejection is traversed. Claim 40 as amended recites, in part, a mold for molding a package for a die bonded to a substrate, the mold defining a rib having a thickness at least as great as a solder bump thickness. Tsunoda does not teach or suggest such a rib. As is apparent from Tsunoda's Fig. 1 and Fig. 4B(d), Tsunoda's resin projections situated adjacent metal bumps (4) are substantially smaller than the metal bumps. In contrast, claim 40 recites defining a rib having a thickness that is at least as great as a solder bump thickness. Not only does Tsunoda fail to teach such a rib, Tsunoda teaches away from such a rib. According to Tsunoda, projections (22) of a mold are provided so that resin (14) is not fed onto terminals (3) on a package surface. See col. 7, lines 24-28 and Fig. 4B(d). A larger thickness, such as recited in claim 40, would be more likely to result in resin covering the terminals, and thus, according to Tsunoda, such a larger thickness should be avoided. Thus, Tsunoda fails to teach, suggest, or provide any motivation for the mold recited in claim 40, and claim 40 and dependent claims 41-46 are properly allowable over Tsunoda for at least this reason.

New claim 47 recites a mold for molding a package for at least one die bonded to a substrate. A first mold portion defines a package cover for encapsulating the at least one die and at least a perimeter portion of a surface to which the die is bonded. A second mold portion defines a rib that projects outwardly from a surface of the substrate opposite the surface of the substrate to which the at least one die is bonded. Tsunoda does not teach a mold for a package cover for encapsulating at least a perimeter portion of a surface to which the die is bonded. Instead, Tsunoda teaches that a perimeter portion of a surface of a circuit board (2) is attached to

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a lead frame (6, 7, 8, 9). See Tsunoda, Fig. 1. Because Tsunoda teaches that this circuit board perimeter is attached to and covered by a lead frame, Tsunoda fails to teach or suggest encapsulating this circuit board perimeter portion. For at least this reason, claim 47 and dependent claims 48-50 are properly allowable over Tsunoda.

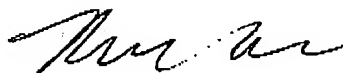
New claim 51 recites a mold for molding a package for a ball grid array assembly having a surface configured to receive solder bumps. The mold comprises a first mold portion and a second mold portion that define a cavity that substantially surrounds the ball grid array (BGA) assembly except at the surface configured to receive solder bumps. Tsunoda does not teach or suggest such a mold. Tsunoda teaches BGA packages in which a lead frame (6) extends through an encapsulating resin (14). See Tsunoda, Fig. 1. Tsunoda does not teach or suggest a mold configured to encapsulate the BGA package so that the lead frame (6) is also encapsulated. For at least this reason, claim 51 and dependent claims 52 are properly allowable over Tsunoda.

In view of the preceding amendments and remarks, all pending claims are in condition for allowance, and action to such end is requested. If any issues remain, the Examiner is requested to call the undersigned attorney.

Respectfully submitted,

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